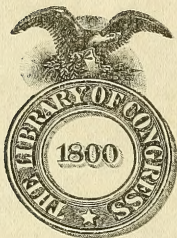


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Maryland State Board of Forestry
The Forests of Washington County



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MARYLAND STATE BOARD OF FORESTRY

F. W. BESLEY, State Forester

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THE FORESTS
—OF—
WASHINGTON
COUNTY

BY

F. W. BESLEY, State Forester



BALTIMORE, MARYLAND
JANUARY, 1922

MARYLAND STATE BOARD OF FORESTRY

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The Forests of Washington County.

INTRODUCTION.

At the time of the first settlements, about 200 years ago, practically the entire land surface was covered with forests. As settlement advanced the forests receded, the better soils in Hagerstown Valley coming under the plough, as the fertile character of the land became better known. From a condition of 99 per cent. forest at the beginning, the forest area has, through successive stages of development, been reduced to 24 per cent. This 24 per cent., however, is producing timber of considerable value and presents possibilities of far-reaching consequences under the improved methods of forest management herein described.

Washington County lies in three physiographic divisions—the South Mountain—Blue Ridge section, the Hagerstown Valley, and the Appalachian Highlands—presenting variations in soil and growth conditions reflected in the great variety of tree species. The highly developed condition of the County, with its improved road system and large railroad mileage, opens up splendid, available markets for forest products.

A forest survey of the County was made in 1911, resulting in the mapping and classifying of all of the forest lands. This data is presented in graphic form on the large forest map, folded in the inside cover of this report. Statistics as to the annual production of forest products and the many uses of the forests have been obtained, and the records for the last calendar year, 1920, are used in this report.

LAND CLASSIFICATION.

Improved farm land.....	191,842 acres	63 per cent.
Wooded area.....	72,274 acres	24 per cent.
Waste land.....	41,006 acres	13 per cent.
Total.....	305,122 acres	100 per cent.

DISTRIBUTION OF THE FORESTS.

The woodlands are very unevenly distributed over the County. The great bulk of the forests are in two sections, one along the eastern boundary, comprising the South Mountain and the Blue Ridge section, the other in the western part of the County, in the Alleghanies, with the intervening half of the County, embracing the Hagerstown Valley, containing but a small percentage of scattered woodland, constituting in some sections only 2 per cent. of the area. The section from Fairview Mountain, westward, contains the largest percentage of forest land. The forests are confined for the most part to rocky ridges and steep slopes, with the better type of soils of the valleys and more rolling land cleared for agricultural crops.

Table No. 1 shows the area, stand, and value of sawed timber by election districts. The character and distribution of the forest is shown more clearly on the forest map at the end of this report.

DESCRIPTION OF THE FORESTS.

The forests of the County are made up most largely of hardwood species, principally oak, hickory, maple, tulip poplar, and gum, with a large number of other species in small proportion. In the western half of the County are small areas of pure pine, with much larger areas of pine in mixture with hardwood. The pine represented in the County is almost entirely scrub pine, although white pine is found to a small extent in the extreme western part. Chestnut formerly comprised a large proportion of the stands, particularly in the eastern section of South Mountain and the Blue Ridge, and still forms a considerable proportion along the prominent ridges in the western part of the County where the chestnut blight has not yet killed all the chestnut, as is the case in the eastern section of the County. The flat Hagerstown Valley, with its limestone soil, upon which the chestnut does not grow, apparently furnished a temporary barrier to the westward spread of the chestnut blight. The disease, however, is thoroughly established in the western section, having gotten into the State southward from Pennsylvania, and it is only a matter of a few years before the chestnut in this section will be destroyed as a commercial species, as is now the case in the eastern part of the State.



PLATE I. FIG. 1.—Quirauk Tower. Built by the Western Maryland Railroad, equipped and maintained as a fire observation station by Maryland and Pennsylvania in co-operation.



PLATE I. FIG. 2.—Forest on East Side of Fairview, Showing Chestnut Killed by the Blight.

THE FORESTS OF WASHINGTON COUNTY.

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WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area. Acres.	Wooded Area. Acres.	Per Cent Wooded.	Stand of Saw Timber in Board Feet. All Trees More Than Nine Inches in Diameter.				Stumpage Value.		
				Hardwood		Pine		Hardwood \$9.00 per M.	Pine \$9.00 per M.	Total \$
				M. Bd. Ft.	M. Bd. Ft.	M. Bd. Ft.	M. Bd. Ft.			
1	16,271	2,230	14	4,547			4,547	\$40,923		\$40,923
2	13,915	881	6	1,764		73		15,876	\$657	16,533
3	1,041	34	3	195			195	1,755		1,755
4	27,177	6,525	24	6,780		670	7,450	61,020	6,030	67,050
5	34,713	18,507	53	18,535		1,030	19,565	166,815	9,270	176,085
6	16,906	2,848	17	6,848			6,848	61,632		61,632
7	12,952	6,805	53	9,798			9,798	88,182		88,182
8	13,860	5,305	38	4,498			4,498	40,482		40,482
9	15,101	372	2	2,154			2,154	19,386		19,386
10	1,408	339	24	1,513			1,513	13,617		13,617
11	10,521	1,764	17	3,000			3,000	27,000		27,000
12	11,545	629	5	3,186			3,186	28,674		28,674
13	17,303	1,128	7	3,716			3,716	33,444		33,444
14	6,763	4,159	61	4,603			4,603	41,427		41,427
15	32,890	9,719	30	11,219	184		11,403	100,971	1,656	102,627
16	18,039	6,020	33	16,524			16,524	148,716		148,716
17	411	15	36	40			40	360		360
18	10,769	290	3	1,453			1,453	13,077		13,077
19	8,836	764	9	1,306			1,306	11,754		11,754
20	18,222	1,912	10	5,310			5,310	47,790		47,790
21	658	111	17	538			538	4,842		4,842
22	4,428	92	2	412			412	3,708		3,708
23	17,136	1,452	8	3,730	121		3,851	33,570	1,089	34,659
24	4,719	189	4	853			853	7,677		7,677
25	4,501	184	4	540			540	4,860		4,860
County	320,085	72,274	23	113,062	2,078		115,140	\$1,017,558	18,702	\$1,035,860

The forests may be separated generally into three types, dependent upon soil and moisture conditions. The *ridge type*, extending along the top and upper portions of the ridges, consists largely of chestnut oak, mixed with scarlet oak and chestnut. Here the soils are the thinnest and driest, consequently the growth is slow and the trees short and more limby. This type, in addition to being the most inaccessible, is also of the lowest stumpage value, due to the inferior quality of the product.

The *slope type*, comprising the forests along the slopes of the mountains and hills, having somewhat deeper soil and a greater moisture contents than in the case of the ridge type, also has a better tree growth. The principal species are chestnut, black oak and white oak, on the upper slope; and on the lower slopes white oak, red oak, hickory, tulip poplar. The *bottom type* comprises a much smaller percentage of the forest area than the other two, and is found on the flats along the river and streams, and consists principally of ash, elm, willow and sycamore, together with some white oak, red oak and hickory.

The forests are almost entirely of second growth, the original forest having been cut many years ago, and in some cases the forests have been cut over as many as three times. Cuttings for the most part have been made in a destructive manner and left the forests in poor condition. This, together with the damage occasioned by frequent forest fires, especially in the mountain sections, has resulted in rapid deterioration and low production. The effect of excessive cuttings and fires has been to reduce the proportion of valuable species, and by leaving the undesirable species and defective trees, to increase the proportion of inferior growth to the exclusion of more valuable species.

Commercial Types.—Commercially, the forests are divided into three classes as shown by the different colors on the forest map at the back of this report. The three classes are distinguished as *hardwood*, *pine* and *mixed hardwood and pine*. The hardwoods are further divided into three classes, depending upon the stand of timber. The *merchantable hardwoods* are those in which the stand is sufficient to justify profitable logging operations, while the *culled hardwoods* represent the cut over stands, which, however, in some cases, contain a sufficient amount of sawed timber to justify cutting on a small scale. The third class, the *hardwood saplings*, is com-

posed of small areas of young trees, not of sufficient size to be of commercial value. There are but a few small areas of pure pine of the merchantable class, although there are considerable areas in the western part of the County where pine occurs in mixture with hardwoods.

NATIVE FOREST TREES.

There are 79 species of trees native to Washington County, and in addition four introduced species that have become common. In the list given below are many species that do not rank large size, but attain tree form and are, therefore, classed as trees.

CONIFERS.

<i>Common Name.</i>	<i>Botanical Name.</i>
White Pine.....	<i>Pinus strobus</i>
Scrub Pine.....	<i>Pinus virginiana</i>
Pitch Pine.....	<i>Pinus rigida</i>
Table Mountain Pine.....	<i>Pinus pungens</i>
Shortleaf Pine.....	<i>Pinus echinata</i>
Hemlock	<i>Tsuga canadensis</i>
Red Cedar.....	<i>Juniperus virginiana</i>

HARDWOODS.

<i>Common Name.</i>	<i>Botanical Name.</i>
White Oak.....	<i>Quercus alba</i>
Chestnut Oak.....	<i>Quercus prinus</i>
Post Oak.....	<i>Quercus stellata</i>
Swamp White Oak.....	<i>Quercus bicolor</i>
Red Oak.....	<i>Quercus rubra</i>
Black Oak.....	<i>Quercus velutina</i>
Scarlet Oak.....	<i>Quercus coccinea</i>
Pin Oak.....	<i>Quercus palustris</i>
Shingle Oak.....	<i>Quercus imbricaria</i>
Scrub Oak.....	<i>Quercus ilicifolia</i>
Black Jack Oak.....	<i>Quercus marilandica</i>
Bear Oak.....	<i>Quercus nana</i>
Willow Oak.....	<i>Quercus phellos</i>

<i>Common Name.</i>	<i>Botanical Name.</i>
Chinquapin Oak.....	Quercus prinoides
Chestnut	Castanea dentata
Chinquapin	Castanea pumila
Yellow Poplar.....	Liriodendron tulipifera
Mockernut Hickory.....	Carya alba
Pignut Hickory.....	Carya glabra
Big Shellbark Hickory.....	Carya laciniosa
Small Pignut Hickory.....	Carya microcarpa
Shellbark Hickory.....	Carya ovata
Red Maple.....	Acer rubrum
Sugar Maple.....	Acer saccharum
Black Maple.....	Acer nigrum
Mountain Maple.....	Acer spicatum
Box Elder.....	Acer negundo
Black Walnut.....	Juglans nigra
Butternut	Juglans cinerea
Beech	Fagus grandifolia
White Ash.....	Fraxinus americana
Black Ash.....	Fraxinus nigra
Red Ash.....	Fraxinus pennsylvanica
Cucumber	Magnolia acuminata
Umbrella Tree.....	Magnolia tripetala
Black Birch.....	Betula lenta
Yellow Birch.....	Betula lutea
Red Birch.....	Betula nigra
Black Gum.....	Nyssa sylvatica
Sycamore	Platanus occidentalis
Balsam Poplar.....	Populus balsamifera
Large Toothed Poplar.....	Populus grandidentata
Aspen	Populus tremuloides
Black Locust.....	Robinia pseudacacia
Basswood	Tilia americana
White Elm.....	Ulmus americana
Slippery Elm.....	Ulmus fulva
Wild Black Cherry.....	Prunus serotina
Fire Cherry.....	Prunus pennsylvanica
Red Mulberry.....	Morus rubra
Paw Paw.....	Asimina triloba

<i>Common Name.</i>	<i>Botanical Name.</i>
Shad Bush.....	<i>Amelanchier canadensis</i>
Blue Beech.....	<i>Carpinus caroliniana</i>
Hackberry	<i>Celtis occidentalis</i>
Redbud	<i>Cercis canadensis</i>
Dogwood	<i>Cornus florida</i>
Cockspur Thorn.....	<i>Crataegus crus-galli</i>
Scarlet Hawthorn.....	<i>Crataegus coccinea</i>
Persimmon	<i>Diospyrus virginiana</i>
Witch Hazel.....	<i>Hamamelis virginiana</i>
Hop Hornbeam.....	<i>Ostrya virginiana</i>
Mountain Ash.....	<i>Pyrus americana</i>
White Willow.....	<i>Salix nigra</i>
Black Willow.....	<i>Salix alba</i>
Sassafras	<i>Sassafras sassafras</i>
Holly	<i>Ilex opaca</i>
Smooth Alder.....	<i>Alnus rugosa</i>
Staghorn Sumach.....	<i>Rhus typhina</i>

INTRODUCED TREES THAT HAVE BECOME COMMON IN THE FOREST.

<i>Common Name.</i>	<i>Botanical Name.</i>
Silver Poplar.....	<i>Populus alba</i>
Honey Locust.....	<i>Gleditsia triacanthos</i>
Ailanthus	<i>Ailanthus glandulosa</i>
Osage Orange.....	<i>Maclura pomifera</i>

IMPORTANT TIMBER TREES AND THEIR CHIEF USES.

Of the large number of trees named in the foregoing list, all are used to a greater or less extent for various purposes, but taking all of those which by reason of their abundance and good quality are used extensively, the list may be reduced to a comparatively few well recognized species.

Oaks.—The various species of oaks constitute considerably over half of the lumber and timber cut of the County. There is no class of wood that possesses strength and durability to such a marked extent as the oak. The oaks, generally, are divided into two groups, white and red, each group containing several species that cannot

be easily distinguished except by experts. The wood of the two groups is quite similar, although the wood of the red oaks is not quite so strong and much less durable in contact with the soil than the wood of the white oaks.

White Oaks.—The chief species included in this group besides the true white oak are the chestnut oak, swamp white oak and post oak. This wood makes excellent ties and construction timbers, where strength and durability are so important. The demand for this valuable wood has resulted in very heavy cutting and serious depletion of the supply.

Red Oaks.—In the red oak group are included, in addition to the true red oak, black oak, scarlet oak and pin oak. These woods are less durable than white oak, and for most purposes do not command so high a price. Like white oak, however, red oak is heavy, hard, strong, and tough, but not so durable under exposure. For interior uses, such as furniture, finishing, etc., it is the equal of white oak and sells for about the same. Its chief uses are for general construction, railroad ties, car stock, furniture, and interior finishing.

Chestnut.—Chestnut has been the most important tree species and still constitutes a very large percentage of the timber cut. Due to the chestnut blight, it is probable that it will not be able to longer hold its own, and is destined to disappear as a commercial species. Its chief uses are for telephone poles, railroad ties, shingles, staves, lumber and construction timbers on the farm.

Black Locust.—This species is widely scattered over the County and is used, principally, for fence posts. A rather special market has been found for it for use in the making of cross-arm insulator pins. It is a tree that grows along the edges of the woods, fields, and in fence rows, rather than in the forests. The forest grown trees, however, furnish a better quality of wood, due to their slower growth and a larger proportion of hard, durable heart wood.

Tulip Poplar.—This species, commonly known as yellow poplar, is extensively used for pulpwood, and for this purpose is usually sold as soon as the trees have reached the pole stage, 8-12 inches in diameter. The wood is of a fine texture, light, soft, and easily worked, and is used locally for weather boarding, sheathing and general construction.

LUMBER AND TIMBER CUT, 1920.

For the year 1920, there was a total of 32 sawmills operating in the County, of which only 9 operated during the entire year, the remaining 23 suspended operations during the summer, engaging in other work, such as threshing grain, using their traction engines for the purpose. The total output of 4,310,000 feet, board measure, of lumber consisted of boards, planks, and dimension materials, and did not include sawed ties or other products. Many operators get out ties, poles, staves, pulpwood, and cordwood in addition to lumber, while there are others which produce pulpwood, poles, or ties exclusively. While 1920 was a little above the normal in timber production, it represents a considerable falling off of ten years ago, due to the depletion of the available timber supply.

LUMBER AND TIMBER CUT AND SOLD, 1920.

Product.	Amount.	Value.
Lumber (hardwood).....	4,185,000 bd. ft.	\$146,475
Lumber (softwood).....	125,000 bd. ft.	3,125
Lath	150,000 pieces	900
Railroad ties.....	4,750 pieces	4,750
Trolley ties.....	6,025 pieces	3,615
Poles	12,350 pieces	61,750
Staves	3,175,000 pieces	36,513
Pulpwood	2,025 cords	28,350
Cordwood	3,425 cords	17,125
Mine props.....	16,000 pieces	4,800
Tanbark	90 cords	1,440
		\$308,840

HOME CONSUMPTION OF TIMBER AND WOOD PRODUCTS, 1920.

Product.	Amount.	Value.
Building material.....	288,000 cu. ft.	\$17,280
Fuel wood.....	12,720 cords	31,800
Fence rails.....	120,000 pieces	9,600
Fence posts.....	125,000 pieces	15,000
		\$73,680

Total value of timber and wood products..... \$382,523

Lumber.—The total lumber output of 4,310,000 board feet includes 125,000 feet of pine. The larger proportion of hardwood lumber cut was oak and chestnut, with a number of other species in smaller proportion. The average price for lumber at the shipping point was \$35 per thousand, making a total value of \$149,600.

Lath.—Lath are cut in small quantities, usually in connection with sawmill operations, and utilizing principally the slabs and other refuse from sawmills. The cut for 1920 represented 150,000 lath, valued at \$6 per thousand, amounting to \$900.

Railroad Ties.—The demand for railroad ties and the good prices obtained has diverted much of the timber cut from lumber to ties. For this purpose white oak, red oak, and chestnut are the chief woods used, red oak constituting one-half, white oak and chestnut the remainder. Nearly all ties were sawed, the high cost of labor making it unprofitable to hew them. The hewed ties produced were from small tracts where there was not sufficient timber to justify the setting up of a sawmill. In 1920, 4,750 ties were produced at an average price of \$1, amounting to \$4,750.

Trolley Ties.—Trolley ties are variable in size, but are shorter and smaller than railroad ties. Chestnut was used to a greater extent than any other wood. In all, 6,025 were produced, with an average value of 60 cents at the railway, amounting to \$3,615.

Poles.—Since chestnut is the only wood used for telegraph, telephone, and trolley poles, the available supply is being rapidly exhausted by the chestnut blight. The poles range in length from 25 to 60 feet, the average being about 35 feet. In 1920, 12,350 were produced at an average value of \$5 each, amounting to \$61,750.

Staves.—The production of staves for slack barrel cooperage has increased in recent years, amounting to 3,175,000 pieces, valued at \$11.50 per thousand, or a total value of \$36,512.50. Chestnut was the principal wood used for the purpose, although other woods were used without discrimination. A clear cutting system is generally practiced where stave wood is cut.

Pulpwood.—This consisted of 2,025 cords at an average value of \$14 per cord, amounting to \$28,350. Tulip poplar was the principal wood used, although other species, such as butternut, maple, and sycamore, were cut and mixed with it to a limited extent. The

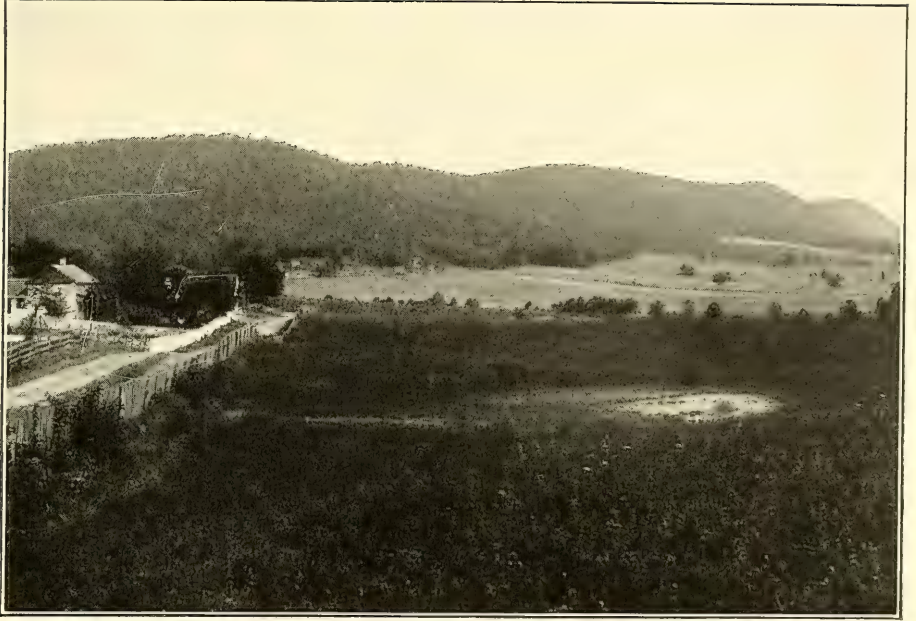


PLATE II. FIG. 1.—East Side of Fairview Mountain. Washington County Forests are mainly confined to the mountain ridges and slopes.



PLATE II. FIG. 2.—Natural Seeding on Abandoned Fields. Sideling Hill.

wood is cut in 5-foot lengths and the bark peeled. A cord consists of 160 cubic feet of closely packed wood and represents the equivalent of about one and one-half cords of cordwood.

Cordwood.—The cutting of cordwood in the winter time is an important industry in some sections. The wood is sold to lime burners and also to residents of towns for fuel purposes. Chestnut, oak, and hickory are the principal species cut for the purpose. The production in 1920 was 3,425 cords at a value of \$5 per cord, amounting to \$17,125.

Mine Props.—A mine prop in Western Maryland consists of a stick 8 to 10 feet in length and from 4 to 5 inches at the top end. Any species of hardwood is accepted and the prices obtained for the past few years have been especially attractive, resulting in the cutting of quantities of small size trees from the forests. The cut for 1920 was 16,000 pieces, which at 30 cents each, f. o. b. cars, amounted to \$4,800.

Tanbark.—Chestnut oak bark is peeled in small quantities from trees cut in the spring and early summer for ties and saw logs. As most cutting operations are conducted in the fall and winter, when bark will not peel, it is only where there is a considerable quantity of chestnut oak to be cut that the trees are felled and peeled in the spring, the logs often being worked up the following winter.

There is one large tannery in the County, located at Williamsport, which gets most of its bark from outside sources. The amount of bark produced in the County in 1920 was about 90 cords, valued at \$1,440.

Home Consumption of Timber and Wood.—In addition to the large amount of timber and wood cut and sold from the forests of the County, the amount cut and consumed on the premises by the owners almost equaled in volume the amount of wood exported. The home-used material consisted principally of four items—building material, fuel wood, fence rails and posts.

Building Materials.—A large amount of timber was used in the rough for building purposes on the farm, such as sills and timbers for barn and stable construction, posts and timber for sheds, hog pens and other structures, together with timbers used in bridge con-

struction, etc. In all, 288,000 cubic feet were so used, valued at \$17,280.

Fuel Wood.—While a considerable portion of the farms use coal in whole, or in part, for fuel purposes, the large majority depend upon wood for fuel. The fuel wood used is, frequently, dead and down material and the inferior trees in the woodlands, although a large part was thrifty, growing timber. It is estimated that 12,720 cords were used in 1920, which, at \$2.50 per cord, had a value of \$31,800.

Fence Rails.—Chestnut, because of its durability and good splitting qualities, is the favorite wood for fence rails. The large amount of blight-killed chestnut has encouraged the making of chestnut rails to utilize the dead timber and extend the use of rail fences, although the wire fences are most commonly used throughout the County. The home consumption for this material in 1920 was approximately 120,000 rails, valued at \$9,600.

Fence Posts.—Approximately 125,000 posts, valued at \$15,000, were cut from the home woodland and used on the premises in 1920. Locust and cedar are preferred to all other woods because of their durable qualities, although chestnut, because of its much greater abundance, is used more largely than any other species. Chestnut ranks next in durability to the locust and cedar, which are not abundant.

WOOD-USING INDUSTRIES.

In addition to the production of raw products from the forests, it is interesting to note how far the use of lumber and wood enter into the wood-using industries, consisting only of local industries which take timber and wood products, from the County and from elsewhere, and by carrying them through further processes of manufacture turn out valuable, finished products. In this particular, Washington County, as a manufacturer of articles made from wood ranks third in the State. While most of the lumber and wood used in the manufacture is imported from outside, there is a certain amount of home-grown material used. There are fifteen such plants in Washington County, employing a total of 966 men, an average of 64 for each plant. Nearly half a million dollars is expended for the lumber and wood to keep these plants going, and the value of these

finished products is further multiplied. Manufacturing centers are at Hagerstown, where furniture-making is the chief wood-using industry. Planing mill products are also produced to a large extent, and to a lesser degree vehicles, musical instruments, wooden boxes, and novelties.

There are eighteen different kinds of wood used by the manufacturing of Washington County, this being a larger variety than is shown by any other district in the State, outside of Baltimore. Oak leads in consumption, followed closely by yellow pine.

With Baltimore in the central section of the State and Salisbury on the Eastern Shore, Hagerstown is the third center of wood manufacturing in the State, with its numerous activities in Western Maryland. It is well situated in a strong network of railway lines, which add great importance to City and County in the shipping of both raw and finished products.

SUMMARY OF WOODS USED IN WASHINGTON COUNTY IN 1916.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost per M. Factory.	Total Cost F. O. B. Factory.
1. Oak species.....	1,595,000	5,070,000	.....	6,665,000	38	\$32.29	\$215,215
2. S. yellow pine.....	.....	3,400,000	.....	3,400,000	19	21.07	71,650
3. Hickory species.....	508,000	2,007,000	.....	2,515,000	14	14.19	35,700
4. Black locust.....	1,075,000	.....	.....	1,075,000	6	9.30	10,000
5. Basswood.....	.....	704,000	.....	704,000	4	25.67	18,072
6. Tulip poplar.....	.....	637,000	.....	637,000	4	30.00	19,109
7. Chestnut.....	50,000	445,000	.....	495,000	3	23.63	11,695
8. Cypress.....	.....	450,000	.....	450,000	3	33.22	14,950
9. Hard maple.....	.....	439,000	.....	439,000	3	22.89	10,049
10. Eastern spruce.....	.....	375,000	.....	375,000	2	32.60	12,225
11. Beech.....	10,000	298,000	.....	308,000	2	23.62	7,274
12. Birch species.....	.....	166,000	.....	166,000	1	26.87	4,460
13. Red gum.....	.....	105,000	.....	105,000	.5	26.57	2,790
14. E. white pine.....	50,000	40,000	10,000	100,000	.5	40.50	4,050
15. W. white pine.....	.....	50,000	.....	50,000	.....	61.00	3,050
16. Elm.....	.....	22,000	.....	22,000	.....	22.73	500
17. Ash species.....	15,000	.....	.....	15,000	.....	30.00	450
18. Mahogany.....	.....	.....	10,000	10,000	.....	145.00	1,450
Totals.....	3,303,000	14,208,000	20,000	17,531,000	100	\$25.25	\$442,689

FOREST PROTECTION.

The forests of the County are suffering severely from the effects of destructive agencies that have been operating for more than 100 years. Chief among them is forest fire, and of scarcely less importance is the damage resulting from reckless or wasteful cutting, followed by the chestnut blight and grazing.

Forest Fires.—Forest fires have, in past years, swept over the mountain forests repeatedly, causing heavy damage. Valuable stands of timber have been destroyed, thrifty young growth has been either killed or so badly damaged as to check its growth and produce a very inferior quality of timber. The small trees on large areas have been completely destroyed, together with the leaf litter, which is the natural protection of the soil, adding fertility and conserving soil moisture. The effect is not only in destroying timber and young growth, and damaging the soil itself, but it also reduces the capacity of the mountain forests to conserve the rainfall, to prevent floods, and to maintain a steady flow in the mountain streams.

Causes of Fires.—An analysis of the forest fire records, kept by the State Board of Forestry, shows that in a single year, including the fall season of 1920 and the spring season of 1921, which is about an average for the past five years, there were 17 fires in the County, which burned over 2,221 acres of land, causing a direct damage of \$5,391, and cost the State and County in equal proportion, \$263 to extinguish. Of these 17 fires, 9 were incendiary (deliberately set out), 5 were caused by railroads, 1 from brush burning, 1 from hunters, and 1 the cause is unknown. The most alarming feature of this record is the large number of incendiary fires, the highest percentage for any county for any year since records have been kept. The forest law provides heavy penalties for maliciously setting fire on another's lands, and in one of the nine cases of deliberate setting of fire, the State Board of Forestry secured a conviction. Such fires are the outcome of perverted ideas about burning over the woodland for huckleberries, pasturage, or what not, some cases of spite work, others apparently pure "cussedness." At least 75 per cent. of the fires are preventable, with proper care on the part of all owners and users of the forest. The State Board of Forestry maintains a protective system for the County, consisting of twelve wardens—one on patrol duty—also a lookout tower at Quirauk in

co-operation with the Western Maryland Railroad and the Pennsylvania Forestry Department. In addition, one lookout tower and two patrolmen in Frederick County look after parts of Washington County on South Mountain. A list of the wardens is given below, together with their locations and telephone calls, corrected to December 1, 1921:

<i>Name.</i>	<i>Location.</i>	<i>Telephone.</i>
Milton S. Coulter.....	Yarrowsburg	Keedysville 9 F 12.
Samuel Detrow.....	Hagerstown	
B. Hayes Exline.....	Exline	Hancock 2 F 4.
C. H. Faulder.....	Smoketown	Hagerstown 4091 F 22.
S. D. Frownfelter.....	Hagerstown	
A. J. Fulton.....	Millstone	Hancock 33 F 11.
Ira B. Glenn.....	Pondsville	Smithsburg 6 F 3.
J. R. Keller.....	Dargan	Keedysville 42 F 2.
W. S. McAllister.....	Indian Spring.....	
F. D. Martin.....	Indian Spring.....	Call Clearspring 110 F 3.
George Norris.....	Sideling Hill.....	Call Hancock 2 F 5.
B. F. Shadrack.....	Maugansville	

Every landowner is required to do what he can to control fires on his own land, but in case the fire cannot be quickly brought under control, is liable to cause considerable damage and threatens neighboring property, he should at once notify the local forest warden, who is a regularly commissioned State officer, with full authority to employ all needed assistance, and to take any measures that may be necessary to suppress forest fires.

Much can be done in the way of preventive measures, such as clean management in the woodland, including the close utilization of the tops and lops after cutting operations, maintaining roads through the woodlands free of inflammable material to serve as fire lines, and special vigilance on the part of the owner and his employes during dry periods and in particular during the hunting season when there is a larger number of people in the woods.

Destructive Cutting Practices.—It is natural and proper that the timber in the woodlands should be cut when mature. It is the purpose of forestry to grow successive timber crops on forest lands and to maintain their productiveness. Next in importance to the

stopping of fires is the elimination of reckless cutting. The best results can generally be obtained by handling the forests under what is known as the selection system, that is, cutting from the woodlands at intervals, trees as they reach maturity, making room for the new growth that is constantly coming on in uneven aged hardwood forests of mixed species such as are found throughout the County. In the past, the practice has been to remove in one heavy cutting the best timber to the smallest salable size, and leave for succeeding growth the inferior species, and the crooked and defective trees which have little or no prospective value. This has, in most cases, transformed the stand from one which, in the beginning, was made up largely of good species, well formed and well developed trees, to a scrub forest consisting largely of inferior species and poor specimens.

This system, or lack of system, must be completely changed if the forest is to be restored to full productiveness. It is usually poor policy to cut small, thrifty growing trees of high prospective value for the small amount that can be realized at the time. But if the small trees of good species are cut, then, at least, the defective trees and those of poor species should be cut at the same time in order to remove unfair competition and give the good species an even chance. Any land owner may have his woodlands examined and expert advice given as to the best methods of handling them by applying to the State Forester, Baltimore.

Chestnut Blight.—The chestnut blight (*Endothia parasitica*), a fungus disease which first appeared in the County about 1911, has spread rapidly, until in 1920 it has killed, or seriously affected practically all of the chestnut in the eastern section of the County, and has eliminated the chestnut as an important tree species. In the western part of the County, the disease appeared somewhat later, and has not yet caused complete destruction of the chestnut stands, although this is inevitable, and there will scarcely be a live chestnut tree in the County in five years. While the tree is killed by this disease, the wood is not damaged. There has been, in consequence, a much larger quantity of chestnut cut and sold, largely in the nature of salvage in the past five years, than ever before. The next five years, however, will probably see an end of the chestnut timber supply.

Grazing.—It is customary, particularly in the valley sections, to include the farm woodland in the permanent pasture. Where this is done, the damaging effect to the woodland is very apparent. Pastured woodland, especially if it has been grazed for many years, presents a distinct picture, in which the prominent features are, first, the absence of young growth which is needed to perpetuate the forest; second, the absence of a ground cover, consisting of leaves and humus, to serve as a blanket to the soil, conserving moisture, keeping the soil in a good physical condition, promoting tree growth; third, the soil is dry and hard, the trees become stag-headed, with much dead wood in the tops, growth is greatly slowed down, or practically stopped, the stand is very much understocked, open unproductive areas occur, and the sum result is an unproductive, declining woodland and a very poor pasture. Good pasture and good woodland are impossible in the same area. The least amount of damage is done to the woodland from pasturing, when the area is fully stocked and the trees have gotten large enough so that the lower branches are beyond the reach of the cattle. Under such conditions shade will be too dense for grass to grow, although the cattle could have the protection of the woodland without doing very much damage.

FOREST PLANTING.

Washington County contains 41,000 acres of waste land upon which no crop of value is being produced. This is 13 per cent. of the total land area. All of this land is suitable for timber growing and could be made productive by planting it in suitable forest trees. The waste land consists, for the most part, of rocky, barren hillsides, once cleared and cultivated, but from which the soil has been washed away, or has been so badly gullied as to be unfit for agricultural use.

In forest planting, native species of proven worth should be generally used. The larger number of valuable native species permits a wide choice for planting purposes. Only a few of the most desirable species are here named.

Black Locust.—This is a rapid growing tree, producing a very durable wood, especially valuable for fence posts. One year seedlings, about 12 inches high, may be used for planting and should be

spaced about 6x6 feet apart. The locust will do well on poor soil, although it makes a much more rapid growth on good soil. In the latter case, it should reach fence post size in fifteen years. At twenty years, the majority of the trees should make two or three posts each.

White Pine.—This is a native tree of rapid growth, which has soft, even-grained wood, useful for many purposes. It does not thrive on poor, dry soils, but on medium quality soils makes a very satisfactory growth. Trees from about 4-6 inches high are the most practicable size to use for forest planting, and should be spaced approximately 6x6 feet apart.

Red Oak.—This is the most rapid growing of the oaks, and is the most useful hardwood adapted for general forest planting. It can either be propagated by planting the acorns in holes about five feet apart each way, dropping two acorns to the hole, covering about two inches deep, or one-year-old seedlings may be used, spacing them 6x6 feet apart.

Other Species.—Other species, such as white ash on overflow bottom lands, black walnut on deep, moist, fertile soils at the foot of ravines, and scotch pine on high, dry soils where the soil is thin and it is difficult to get any other tree to grow, may be used.

In addition to establishing new planting, there are many small areas in portions of the woodland which are very much understocked, such as where open spaces occur. To restore these areas to productiveness in the shortest time it will often be found practical to either plant them with small trees of a species that will endure shade, such as Norway spruce or sugar maple, or if the cover is sufficiently open, trees like white pine and red oak may be used. Where seedling trees are not easily available, the woodland may be reinforced by the planting of red oak acorns in places where trees are needed.

PLANTING WINDBREAKS.

In the open sections of the County where there is so little woodland as in the Hagerstown Valley, much discomfort and damage results from the unrestrained sweep of the winter winds. This condition can be largely remedied by the planting of windbreaks on



PLATE III. FIG. 1.—Plantation of White Pine Six Years Old. This species has been used successfully for forest planting in Washington County.



PLATE III. FIG. 2.—25-Year-Old Black Walnut Plantation. Near Breathedsville.

the windward side of the house and farm buildings and yards where livestock is kept. The windbreak should consist of two or more rows of trees, preferably evergreens, the rows to be 8-10 feet apart, and the trees 6-8 feet apart in the row in an alternate arrangement. Norway spruce or white pine is the best species to use, although hemlock is almost equally good.

The influence of the windbreak is dependent upon its density, length, and the height of the trees. Its influence is effective for a distance equal to ten times the height of the trees, but to secure the greatest benefit, the windbreak should be located as close to the buildings to be protected, as practicable.

Where there is no wood on the place, the windbreak may be widened to form a combination shelter belt and woodlot, serving a double purpose. Beyond the windbreak of evergreens may be planted suitable hardwoods for the wood supply.

THE FUTURE OF THE FORESTS.

It has been shown on page 15 that the present wood and timber cut of the County is taking, annually, large quantities of material from the forests. The annual cut amounts to 3,435,000 cubic feet, while the most accurate figures on forest growth indicate that the 72,274 acres of woodland are producing in annual growth only 2,890,000 cubic feet. These figures show that the forests are being used 19 per cent. faster than they are growing. The lumber and timber cut has fallen off very markedly in the last eight years, notwithstanding the great advance in price paid for forest products. The falling off in the cut is due almost entirely to the rapid exhaustion of available timber supplies. The present average growth for the entire forest area of the County is not over 40 cubic feet of wood per acre per annum, whereas by eliminating the fire danger and applying correct forestry principles in the management of the woodlands for their highest productive value they could be brought up to a production of 90 cubic feet per acre per annum, or more than twice what they are producing at the present time. This is the purpose of forestry and the attainable status of forest production for the County. This attained, the present timber cut could be doubled without taking more than the annual growth, and production at this rate, could be indefinitely maintained. The increase in

timber values and the great demand for forest products will always insure a good market at remunerative prices. In the past, timber has been cut with very little thought of the future productiveness of the forest, but as values increase, the forests will be handled from an entirely different viewpoint. The woodland owner will look upon his forest as a growing crop, the amount and value of the ultimate harvest depending upon the protection and care given to the growing crop.

The woodlands have suffered so long from fire damage, reckless cutting, damage from grazing, and more recently from the chestnut blight, that it will take many years to bring them back to a condition of full productiveness. The forest fire menace must be stopped, the present practice of continually taking out the best of the timber, such as the young, immature, thrifty growing trees of the best species, leaving the crooked and defective trees and those of the poorer species, must be supplanted by improved methods. The forest is made up of many tree species, each of different relative value, and it is for the forest owner to regulate his cuttings in such a way as to give preference to the better species, eliminating the poorer trees, and converting his woodland from a scrub forest to one of high productiveness. This can generally be done by judicious thinnings and improvement cuttings where firewood and other low-grade material can be utilized. Washington County possesses forests of the highest potential value, which, if properly handled, will continue to be one of its most valuable assets.

WASHINGTON COUNTY REPORT.

SUMMARY.

The forested area of 72,274 acres, which is 24 per cent. of the total land area, is sufficient to supply all of the timber needs if it were fully productive.

Forest fires have done more damage to the forests than all other agencies combined. Ninety per cent. of them are preventable. The fire menace can be stopped by the exercise of reasonable care on the part of those who use or travel through the woodlands.

There are 79 different species of native trees, nearly all used to some extent, and at least 20 of them of considerable commercial importance.

The 32 sawmills cut, in 1920, 4,300,000 feet board measure of lumber, which, with the output of ties, staves, lath, poles, pulpwood, cordwood, mine props, and tanbark by other operators, furnished a lumber and timber output valued at \$308,840. In addition \$73,680 worth of timber and wood was cut and used at home.

There are 15 woodworking plants in the County, employing 966 men, using lumber and wood products to the value of nearly \$500,000 annually, and through process of further manufacture turn this material into valuable articles exceeding in value many times the raw product.

The chestnut blight, a fungus disease, has killed 75 per cent. of the chestnut, one of the most valuable tree species. The remaining chestnut is doomed, and will probably not survive more than five years longer.

There are 41,000 acres of waste land upon which no crop of value is now growing. This is 13 per cent. of the whole land area. Nearly all of it is capable of growing timber, and most of it should be planted in forest trees to restore productiveness without delay.

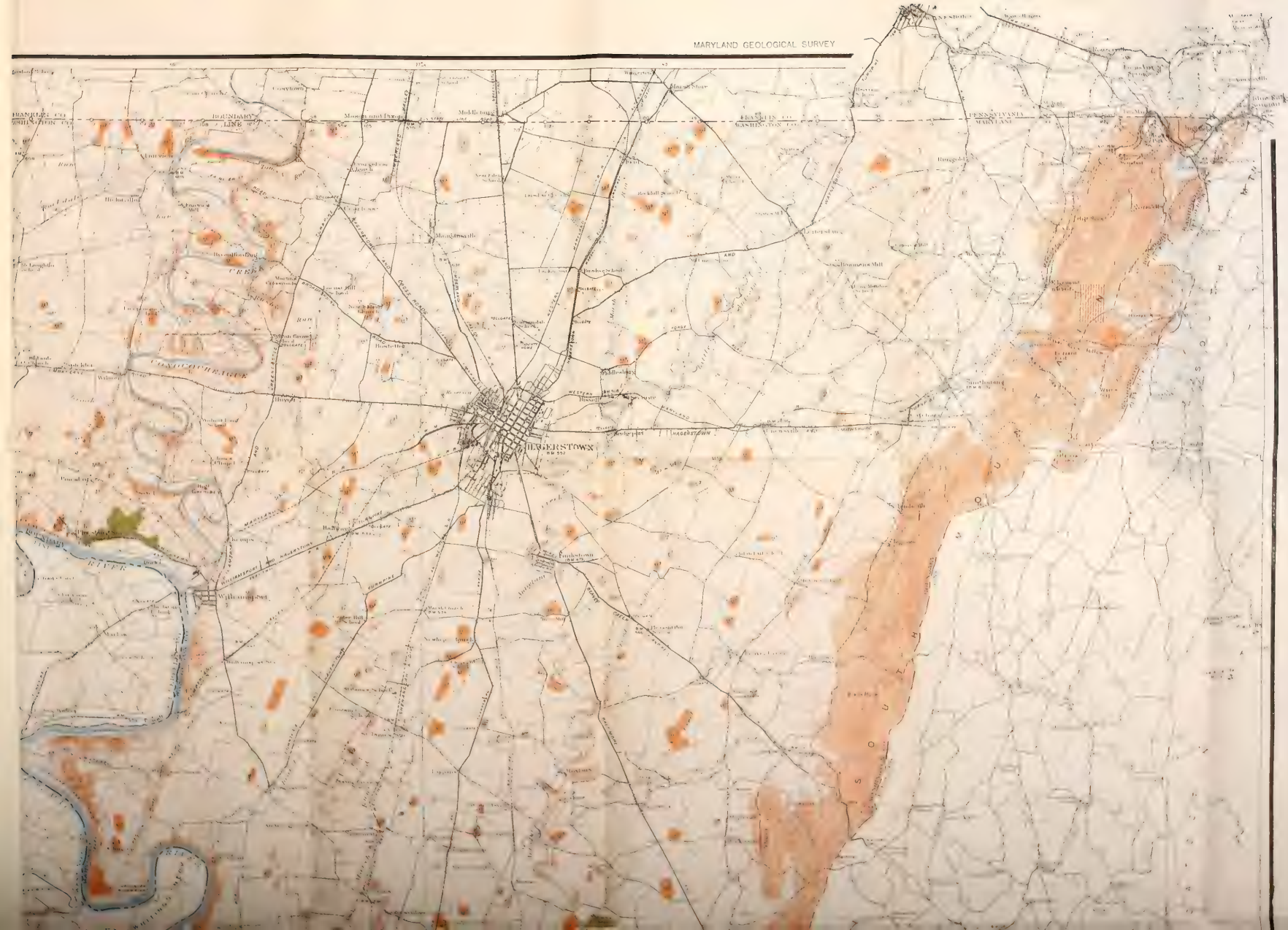
The planting of windbreaks in the open country is needed to protect homes and livestock from severe winter winds.

Due to damage from fires, destructive cutting methods and grazing the forest area is not producing, on the average, more than 40 cubic feet of wood growth per acre per annum.

The forest lands, protected from fires, and properly managed, are capable of producing 90 cubic feet of wood per acre per annum, or more than twice what they are doing now.

The present annual wood and timber consumption is about 3,435,000 cubic feet, while the annual growth is but 2,890,000 cubic feet. The forest is being used nearly one-fifth faster than it is growing, which means cutting heavily into capital, a procedure that cannot last long without serious consequences. Forest growth must be increased by eliminating fires and practicing real forestry.





MAP OF WASHINGTON COUNTY

SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES

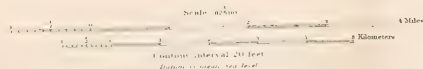
F. W. BESLEY

MARYLAND BOARD OF FORESTRY

WM. BULLOCK CLARK
EXECUTIVE OFFICER

F. W. BESLEY
STATE FORESTER

1913



R. B. Marshall, Chief Geographer.

H. M. Wilson, Frank Sutton, Geographers in Charge.

Topography by J. H. Jennings, W. Carrel Hall, W. N. Morrill, J. H. Wheat, R. L. Harrison, R. A. Kiger, J. S. B. Deingerfeld, A. E. Lehman, A. M. Walker, Robert Maudsley, S. P. Moore.

Control by U. S. C. & G. S., G. T. Hawkins, O. H. Semper, W. R. Winick, J. M. Harris, F. J. McLaugh, Sledge Tatum.

Surveyed 1898-1910.

Forest Survey 1910
10 20

TYPES

M	Merchantable Hardwoods 2nd and 3rd Class
C	Culled Hardwoods 1st, 2nd and 3rd Class
H	Hardwood Saplings
C ₁ S ₁	Culled Hardwood and Pine 3rd, 4th and 5th Class
S ₄₋₅	Scrub Pine 4th and 5th Class
S ₁	Scrub Pine Saplings

STAND OF SAW TIMBER PER ACRE IN BOARD FEET

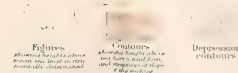
M ¹	8,000-15,000
M ²	5,500-8,000
C ¹	2,000-5,500
C ²	1,000-2,000
C ³	0-1,000
C ⁴ S ¹	500-1,100
C ⁵ S ²	150-400
S ³	500-1,500

CONVENTIONAL SIGNS

CULTURE



RELIEF (printed in brown)



WATER (printed in blue)





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